

Montana Weather/Precipitation Summary

May 2017 NOAA's National Weather Service Great Falls Montana

During May, the average flow showed a weak ridge of high pressure was centered over western Montana. This ridge was stronger than normal. (Fig. 1). This produced slightly above normal temperatures in the state (Fig. 2). Above normal precipitation fell across the west and southern portions of the state, with below normal most other areas (Fig. 3). Wind averages were near to above normal.

May temperatures averaged a little above normal. The statewide composite of 53.3° was 1.3°F above normal. The red line on the graph to the right shows the cumulative 12-month departure from normal, which is about 0.5°F above normal. The temperature anomalies ranged from 2.7°F above normal in central Montana and around Cut Bank to about two degrees below normal around West Yellowstone (Fig. 2). The warmest average monthly temperature was 59.6°F at Glendive and the coolest was 37.8°F at Yellow Mule (Gallatin). This was the 52nd warmest May of record (of 138 years) and warmest since 2013. Six of the last 12 months have had warmer than normal temperatures.

The monthly departure from normal for precipitation across Montana is shown in Figure 3. The wettest areas were across central and south central Montana. The highest precipitation amount recorded was 6.63-inches near Dearborn (Cascade). Elsewhere, 5.70" was reported at Dupuyer Creek SNOTEL (Teton) and Burnt Mountain SNOTEL (Carbon). Several locations across northeast Montana reported their driest May of record. Some of these include Brockway and Medicine Lake. Westby had their second driest of record, while Havre reported their 6th driest May. Statewide, this month averaged 1.34", or 0.80" below normal. This was the 26th driest of record and the driest since 2009. The statewide composite precipitation for the past 12 months is 2.08" above normal. The green line on the graph to the right shows the cumulative 12-month departure from normal. Eight of the past 12 months have measured above normal precipitation.

The statewide average winds were weaker than normal over most of the state. Statewide, the month ranked as the 9th calmest May of record. The statewide composite average was 8.8-mph, 0.7-mph below normal. The brown line of the wind graph to the right shows the 12-month cumulative statewide wind departure from normal. The 12-month average is running near normal. Seven of the past 12 months have had above normal average speeds. The fastest average speed was 13.5-mph at Comertown MDT (Sheridan), Rock Spring MDT (Rosebud) and Deep Creek RAWS (Glacier). The strongest wind gust was 75 mph at Chester during a thunderstorm on the 12th.

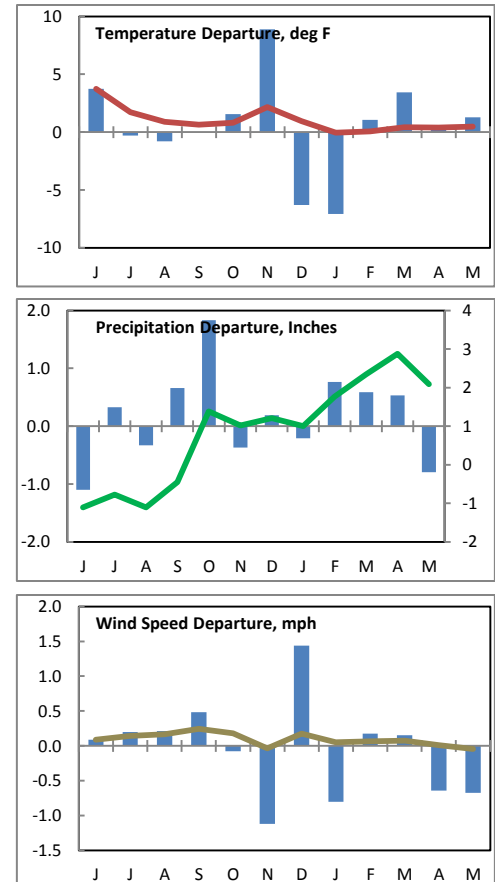
Soil moisture in May ranks as the 4th highest of record (records from 1995). The 30 locations included in the soil moisture composite are shown in Figure 5.

Refer to NEIC's State of the Climate report for the latest monthly discussion:

<http://www.ncdc.noaa.gov/sotc/>

May 1-5

The first few days of May provided mainly benign weather conditions. Temperatures warmed from the 50s to 80s by the 5th.



May 6-15

This period produced quite a few thunderstorms with large hail and strong winds. Thunderstorm gusts reached 64 mph at Malmstrom AFB and 65 mph near Zortman on the 6th. Thunderstorm winds downed trees in a campground near Elliston (Powell) causing one death as a tree fell on a tent. The warmest temperatures of the month also occurred, with highs in the lower 90s in eastern Montana. On the 12th, strong thunderstorms over north central Montana produced wind gusts to 75 mph at Chester. Power poles were snapped in the area causing power outages. Sharply colder air brought snow to the Butte area on the 13th. Thunderstorms developed over southeast Montana on the 15th, producing 1-inch hail near Broadus and Alzada.

May 16-19

A storm system brought heavy snow and heavy precipitation to portions of the state. Rainfall amounts to 4-inches fell along the Rocky Mountain Front. Up to two-feet of snow fell in the Rockies, 7.5-inches at Philipsburg, and 4.5-inches at Missoula. Heavy snow also fell in the southern mountains. Mystic Lake measured 36", Nye had 31", Fishtail recorded 24", and Red Lodge had 17". A small EF1 vortex was spotted near Kalispell on the 18th.

May 20-31

Mild temperatures prevailed through the end of the month. A windy period on the 24th produced winds to 74 mph at Deep Creek RAWS, 68 mph at Oswego (Valley) and Denton (Fergus), while a thunderstorm produced winds to 59 mph at Miles City.

Precipitation/convection

Severe convective weather occurred on five days in May, which is normal.

Spring (Mar-May) summary

The composite statewide average temperature for the season was 44.4°F (1.5°F above normal). This was the 31st warmest of record.

The composite precipitation was 4.75", or 0.35" above normal. March and April's above normal precipitation was largely offset by a drier than normal May. This is the 50th wettest such period of record. Precipitation has been below normal over northeast Montana during April and May. This is shown in the precipitation departure from normal map (Figure 6).

Composite snowfall was 12.4". This was 3.6" below normal, but the heaviest period snowfall since 2014. This is the 46th lowest period snowfall amount. For winds, the average state wind speed was 9.2-mph, or 0.4-mph below normal. This was the 10th calmest year of record.

Water-year-to-date and calendar-year summary

The composite statewide average temperature for the water year through May was 33.8°F (0.4°F above normal). This was the 53rd warmest of record but the coolest since 2013. The calendar year average temperature is 34.4° (0.1°F above normal) and the 52nd warmest of record.

The composite precipitation for the water year was 11.09", or 2.53" above normal. September, October, February, March and April were particularly wet. This is the 7th wettest such period of record, and the wettest since 2010. The calendar year average precipitation is 6.72" (0.94" above normal) and the 31st wettest of record.

Composite snowfall for the water year was 65.6". This is 10.0" above normal and the heaviest period snowfall since 2014. This is the 19th highest period snowfall amount. The calendar year composite snowfall is 38.8" (4.9" above normal) and the 35th highest of record.

For winds, the average state wind speed for the water year was 9.0-mph, or 0.2-mph below normal. This was the 11th calmest of record. The calendar year average wind speed is 9.3-mph (normal) and the 22nd lowest of record.

May summary information:

| | | | |
|--|---|---|--|
| High Temperature | 93°F near Ninemile (Missoula) (31 st) | Greatest Precip | 6.63" near Dearborn (Cascade) |
| Low Temperature | 9°F at Placer Basin (Sweet Grass) (19 th) | | |
| Warmest Ave Temp | 59.6°F at Glendive | Peak Wind Gust | 75 mph at Chester (12 th) |
| Coollest Ave Temp | 37.4°F at Yellow Mule (Gallatin) | | |
| Range of Temp departures | -3.3°F at Thompson Falls to 2.6° at Broadus (Powder River) | Highest Ave Wind | 13.5 mph at Comertown MDT (Sheridan), Rock Springs MDT (Rosebud) and Deep Creek RAWS (Glacier) |
| 21 city mean monthly Temperature/Normal | 53.3/52.0F normal. 52 nd warmest of record (since 1880). 62 nd percentile. | 20 city mean monthly wind speed/Normal | 8.8 mph/9.5 mph; 9 th calmest of record (since 1936). 14 th percentile. |
| 22 city mean monthly precipitation/Normal | 1.34"/2.14" – 63% of normal. 26 th driest of record (since 1880). 20 th percentile. | | |

**Historical Rank of Precipitation (inches)
for the Current Month and Water Year to Date**

| Location | May | % of Norm | Rank | Pcntl | Oct 1 – May 31 | % of norm | Rank | Pcntl | Years |
|---------------|------|-----------|------|-------|----------------|-----------|------|-------|-------|
| Baker | 1.57 | 100% | | | 4.20 | 76% | | | 19 |
| Billings | 1.61 | 65% | 66 | 55 | 14.19 | 151% | 3 | 2 | 116 |
| Belgrade | 1.72 | 70% | 54 | 66 | 8.88 | 106% | 25 | 30 | 80 |
| Butte | 1.59 | 76% | 73 | 59 | 8.73 | 128% | 27 | 21 | 122 |
| Cut Bank | 0.96 | 49% | 83 | 75 | 7.35 | 158% | 10 | 8 | 110 |
| Dillon | 1.49 | 77% | 48 | 61 | 7.02 | 130% | 6 | 7 | 77 |
| Glasgow | 0.58 | 30% | 89 | 74 | 6.14 | 114% | 43 | 36 | 117 |
| Great Falls | 2.01 | 83% | 67 | 52 | 10.35 | 134% | 18 | 14 | 125 |
| Havre | 0.34 | 20% | 132 | 96 | 6.52 | 127% | 49 | 35 | 137 |
| Helena | 1.39 | 74% | 86 | 62 | 6.81 | 120% | 57 | 41 | 138 |
| Jordan | 0.29 | 13% | | | 4.72 | 79% | | | 19 |
| Kalispell | 0.80 | 40% | 105 | 85 | 16.75 | 158% | 2 | 1 | 123 |
| Lewistown | 2.73 | 96% | 59 | 48 | 11.25 | 128% | 26 | 21 | 121 |
| Livingston | 3.23 | 121% | 31 | 26 | 13.10 | 152% | 4 | 3 | 112 |
| Miles City | 0.43 | 20% | 134 | 96 | 3.53 | 56% | 133 | 95 | 140 |
| Missoula | 1.39 | 69% | 82 | 58 | 12.70 | 146% | 12 | 8 | 136 |
| Mullan Pass | 1.91 | 71% | 47 | 60 | 48.00 | 153% | 3 | 3 | 76 |
| Wolf Point | 0.22 | 12% | | | 3.45 | 66% | | | 19 |
| Glendive | 0.75 | 34% | 106 | 87 | 5.06 | 76% | 89 | 76 | 117 |
| Sidney | 1.01 | 50% | 62 | 79 | 5.36 | 81% | 48 | 62 | 77 |
| BZN-MSU | 2.84 | 89% | 65 | 46 | 15.35 | 125% | 10 | 7 | 138 |
| W Yellowstone | 0.67 | 30% | 98 | 93 | 24.59 | 162% | 5 | 4 | 94 |

Rankings and Percentiles are 1=driest, higher numbers=wetter.

For an automated version of this chart, updated daily, go to

<http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS>

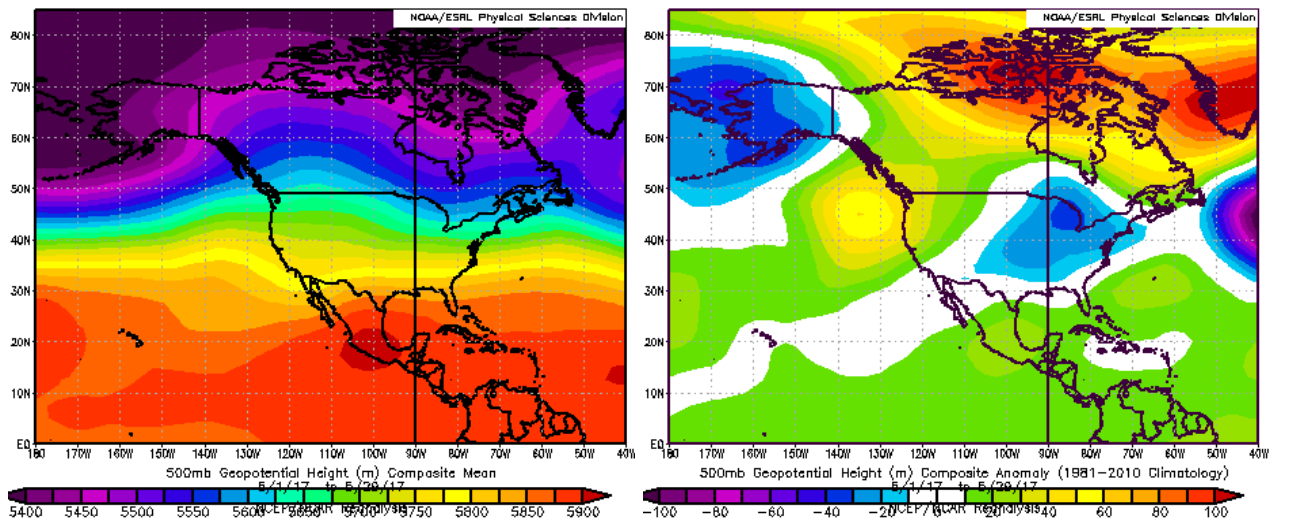


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (upper left) and departure from normal (upper right).

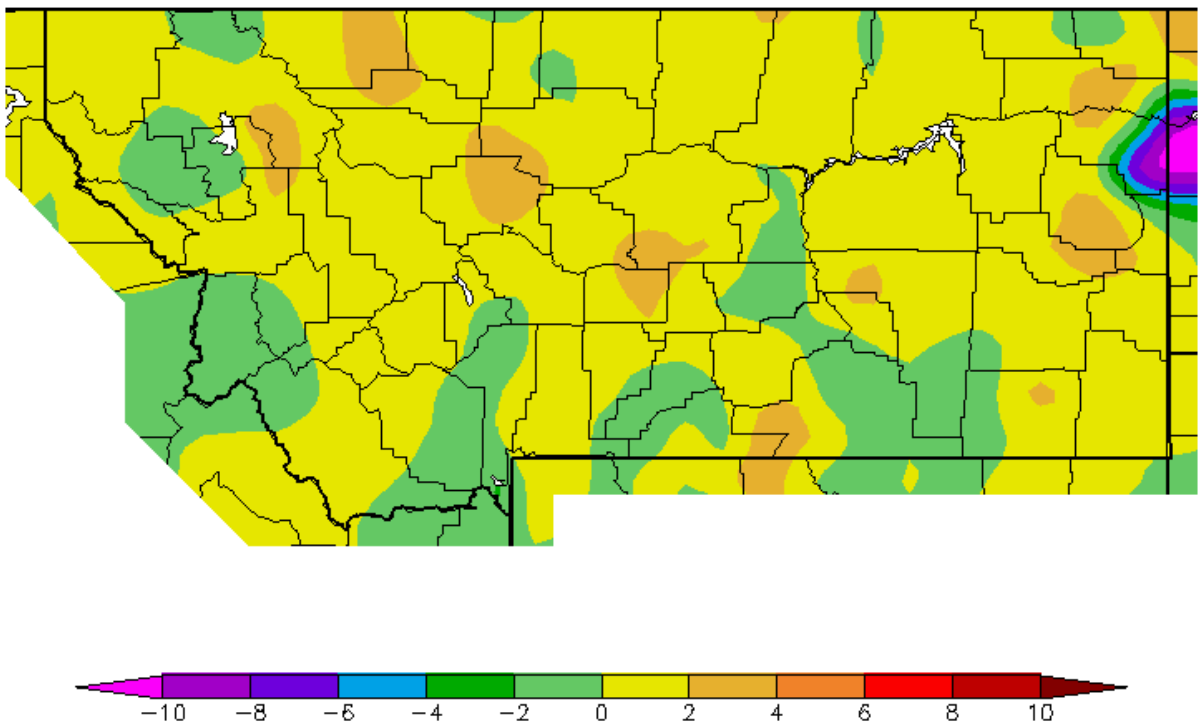


Figure 3. May 2017 temperature departures from normal (°F) (Western Region Climate Center).

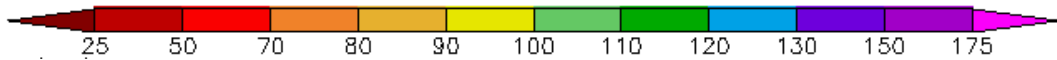
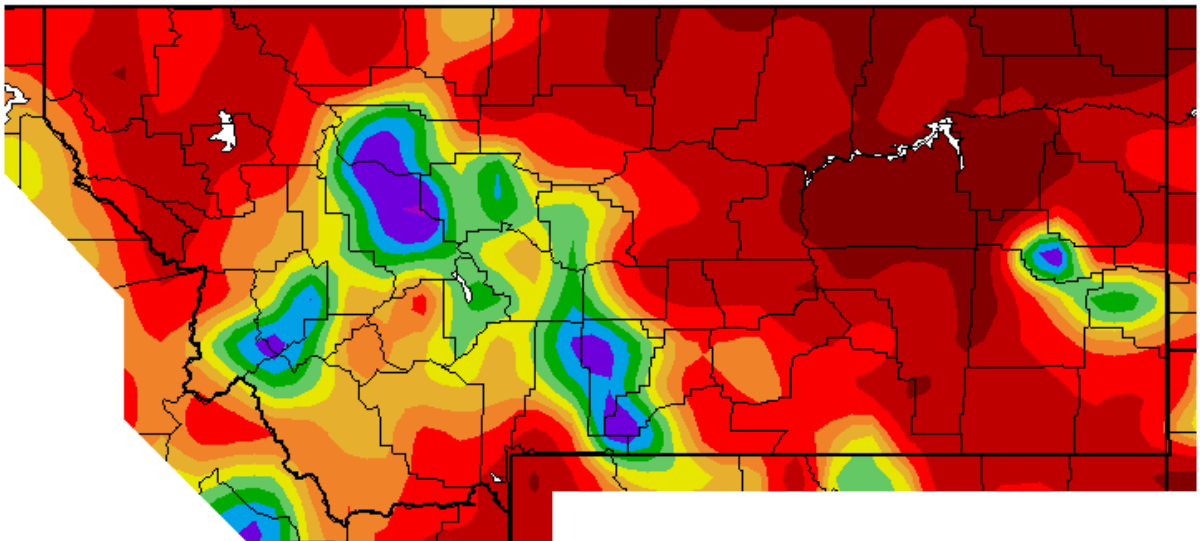


Figure 4. May 2017 precipitation departures from normal (percent) (Western Region Climate Center).



Figure 5. Locations included in soil moisture composite computation.

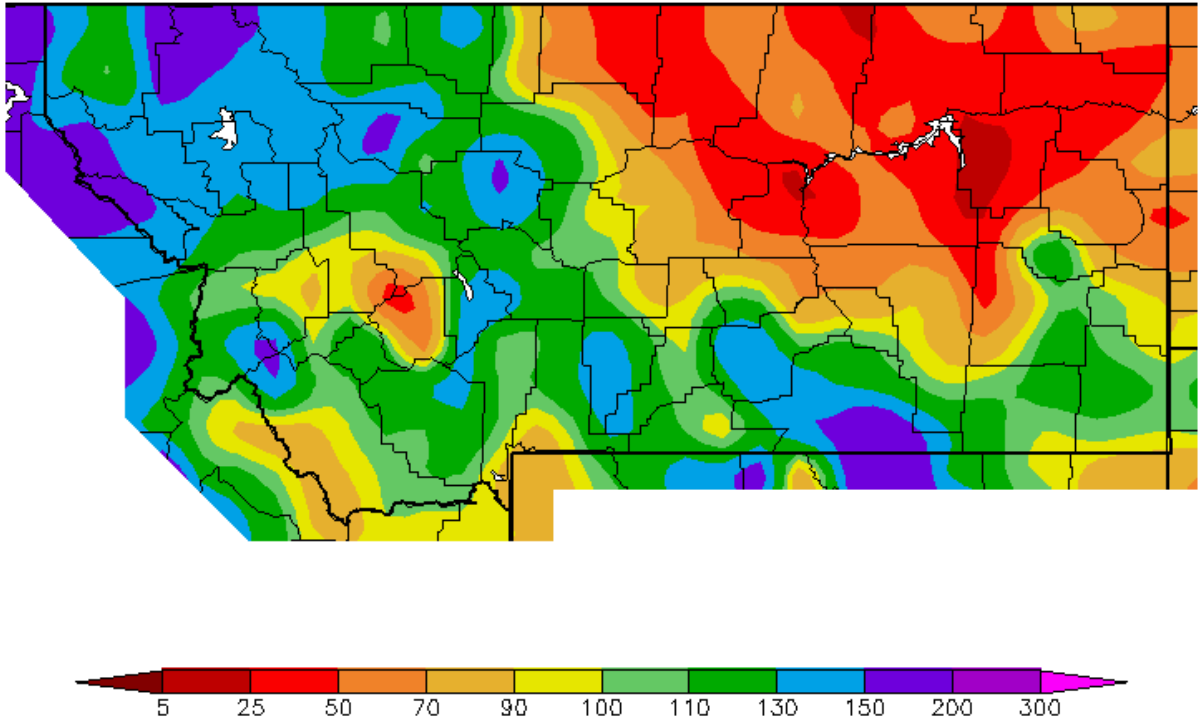


Figure 6. March-May 2017 precipitation departures from normal (percent) (Western Region Climate Center).

For a state map of % of normal water year precipitation (updated around the 7th of each month), go to:

<http://www.wrh.noaa.gov/tfx/climate/monthlysum/climatesum.php?wfo=tfx>

For the latest information on mountain snowpack from the NRCS, go to: <http://www3.wcc.nrcs.usda.gov/snow/index.html>

For the latest U.S. Drought Monitor, issued weekly by the National Drought Mitigation Center, USDA and NOAA, go to: <http://droughtmonitor.unl.edu/>

These data are preliminary and have not undergone final QC by NEIC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Environmental Information Center (NEIC) <http://www.ncdc.noaa.gov>. Many more links are on the Drought Information Page of the NWS Great Falls web site at <http://www.wrh.noaa.gov/tfx/main/drought.php?wfo=tfx>. The climatological record for normals is 1981-2010. The ranking period for temperature, precipitation and snowfall is since 1880. The ranking period for wind speeds is since 1936. The ranking period for soil moisture is since 1995.